

The alleges that JP-'484 and Gerstung describe each and every element as set forth in claims 1-6. Applicants respectfully traverse.

Applicants have amended claims 1 and 3 to describe a fin for a heat exchanger comprising a plurality of waving strips, in which "adjacent waving strips are connected at connecting portions between said first flat portions of said adjacent waving strips and between said second flat portions of said adjacent waving strips, [wherein] a length (T) of an outer surface and an inner surface each connecting portion in said longitudinal direction of each waving strip is less than or equal to about a thickness (t) of a plate forming each waving strip." (Emphasis added.) As such, Applicants' claimed invention requires that the connecting length (T) of the outer and the inner surface of the connecting portion be less than or equal to about the plate thickness (t).

In contrast, **Fig. 5** of JP-'484 is addressed in Applicants' Background of the Invention Section, and corresponds to Applicants' **Fig. 13**. See, e.g., Appl'n, Page 2, Line 10. JP-'484 describes a plurality of waving strips 102 and 103 which are arranged adjacent to, and longitudinally offset from, each other. Adjacent strips 102 and 103 are connected to each other at adjacent raised portions and adjacent depressed portions. Moreover, a connection length of these connections portions is about  $L/2$ , in which L is the length of each raised portion, and also is the length of each depressed portion. As such, the connection length of the connection portions described in JP-'484 is about  $1/2$  of the length of the raised portion, which is substantially greater than a thickness of the waving strips 102 and 103. (Emphasis added.) Moreover, because the connection portion is substantially greater than the thickness of the waving strips 102 and 103, the waving strips 102 and 103 cannot be formed by a rolling method without deforming the waving strips 102 and 103. Consequently, waving strips 102 and 103 must be formed by a die press fitting method. See, e.g., Appl'n, Page 2, Lines 8-31.

Applicants maintain that when a rolling process is employed to manufacture a fin, the length of the connection portion may be constant throughout the thickness of the waving strip. In contrast, when a pressing process is employed to manufacture a fin, the length of the connection portion varies through the thickness of the waving strip. Moreover, a pressing process may crush or damage the inclined portion of the waving strip. As such, in JP-'484, the length of the outer surface and the inner surface of the connection portion between adjacent

waving strips 102 and 103 cannot be less than or equal to the thickness of waving strip 102 (103).

Nevertheless, the Office Action asserts that “as evidenced by Gerstung, the device of [JP-‘484] is believed to be similar to Applicants’ instant invention as claimed.” Office Action, Page 3, Lines 7-8. As such, the Office Action relies on Gerstung to conclude that the length of the outer surface and the inner surface of the connection portion between adjacent waving strips 102 and 103 is less than or equal to the thickness of waving strip 102 (103). Applicants respectfully disagree.

Gerstung depicts a fin 44 of a heat exchanger comprising a plurality of waving strips 47, and adjacent waving strips 47 are connected at connecting portions. The Office Action asserts that uncut portions of waving strips 47 define the connection portion between adjacent waving strips 47, and that “the uncut portions are intersections between the ‘flat portions’ of adjacent waving strips. The uncut portions between the rightmost waving strip and the adjacent waving strip show the ‘connecting portions’ have the same length as the ‘outer’ surface of the fin and the ‘inner’ surface of the fin. Thus, the length of the ‘connecting portion’ is constant throughout the fin thickness.” Office Action, Page 3, Lines 11-14; and Page 4, Line 1. Applicants respectfully disagree.

Specifically, although the drawings in Gerstung depict the connection between the outer surfaces of adjacent waving strips 47, the drawings in Gerstung do not depict the connection between the inner surfaces of adjacent waving strips 47, i.e., the connection between the inner surfaces of adjacent waving strips 47 is obstructed by the outer surfaces of adjacent waving strips 47. Thus, Gerstung fails at least to disclose that “a length (T) of an outer surface and an inner surface each connecting portion in said longitudinal direction of each waving strip is less than or equal to about a thickness (t) of a plate forming each waving strip,” as set forth in amended claims 1 and 3.

Moreover, the Office Action relies on Gerstung to supply the limitation that “a length (T) of an outer surface and an inner surface each connecting portion in said longitudinal direction of each waving strip is less than or equal to about a thickness (t) of a plate forming each waving strip,” as set forth in amended claims 1 and 3. However, as described above, the connection between the inner surfaces of adjacent waving strips 47 is obstructed by the outer surfaces of adjacent waving strips 47. Although the Office Action may use Gerstung or another

reference as evidence that the length of the connection portion in JP-‘484 is constant throughout the thickness of the waving strip, “such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill in the art.” MPEP 2131.01 III (Emphasis added.) Because the Office Action relies solely on the drawings of Gerstung, and the connection between the inner surfaces of adjacent waving strips 47 is obstructed by the outer surfaces of adjacent waving strips 47, Applicants maintain that the Office Action’s reliance on Gerstung to assert that the length of the connection portion in JP-‘484 is constant throughout the thickness of the waving strip is improper. Therefore, Applicants respectfully request that the Examiner withdraw the anticipation rejections of claims 1 and 3.

Claims 2 and 4-6 depend from amended claims 1 and 3, respectively. Therefore, Applicants respectfully request that the Examiner also withdraw the anticipation rejection of claims 2 and 4-6.

#### CONCLUSION

Applicants respectfully submit that this application is in condition for allowance, and such disposition is earnestly solicited. If the Examiner believes that a further interview with Applicants’ representatives, either in person or by telephone, would expedite prosecution of this application, we would welcome such an opportunity. Applicants believe that no fees are due as a result of this responsive amendment. Nevertheless, in the event of any variance between the fees determined by Applicants and those determined by the U.S. Patent and Trademark Office, please

charge any such variance to the undersigned's Deposit Account No. 02-0375.

Respectfully submitted,

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MARKED-UP COPY OF AMENDMENTS TO THE CLAIMS  
AMENDMENTS

IN THE CLAIMS:

Please amend claims 1 and 3, as follows:

1. (amended) A fin for a heat exchanger comprising a plurality of waving strips, each having a repeated structure comprising a first flat portion, a first inclined plate portion extending from said first flat portion at a first inclination angle, a second flat portion extending from said first inclined plate portion in parallel to said first flat portion, and a second inclined plate portion extending from said second flat portion at a second inclination angle, arranged in this order, wherein said waving strips are arranged adjacent to each other in a transverse direction to each waving strip and are offset from each other in a longitudinal direction, such that said adjacent waving strips are connected at connecting portions between said first flat portions of said adjacent waving strips and between said second flat portions of said adjacent waving strips, and a length (T) an outer surface and an inner surface of each connecting portion in said longitudinal direction of each waving strip is less than or equal to about a thickness (t) of a plate forming each waving.

3. (amended) A heat exchanger comprising:  
a plurality of flat-type heat transfer tubes and  
an inner fin provided in each heat transfer tube, said inner fin comprising a plurality of waving strips, each having a repeated structure comprising a first flat portion, a first inclined plate portion extending from said first flat portion at a first inclination angle, a second flat portion extending from said first inclined plate portion in parallel to said first flat portion, and a second inclined plate portion extending from said second flat portion at a second inclination angle, arranged in this order, wherein said waving strips are arranged adjacent to each other in a transverse direction to each waving strip and are offset from each other in a longitudinal direction, such that said adjacent waving strips are connected at connecting portions between said first flat portions of said adjacent waving strips and between said second flat portions of said adjacent waving strips, and a length (T) an outer surface and an inner surface of each connecting portion in said longitudinal direction of each waving strip is less than or equal to about a thickness (t) of a plate forming each waving strip or less.